The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

Noise Technical Report

Interstate Highway (I-) 10 from State Highway (SH) 46 to Farm-to-Market Road (FM) 3351
Bexar and Kendall Counties, Texas

CSJ: 0072-06-082 & 0072-07-075

May 2019
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# APPENDIX 1: Figures

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1.0 Project Description

The Texas Department of Transportation (TxDOT) San Antonio District is proposing improvements to Interstate Highway (I-) 10 between Farm-to-Market Road (FM) 3351 (Ralph Fair Road) and State Highway (SH) 46 in Kendall and Bexar Counties, Texas. The project is located within the city limits of Boerne, Fair Oaks Ranch, and San Antonio as well as the census-designated area of Scenic Oaks. This is within the Alamo Area Metropolitan Planning Organization (AAMPO) region. I-10 currently functions as a major arterial that provides access to work, schools, places of work, recreational facilities, shopping areas, and medical facilities. Regionally, I-10 serves as an important route for commuters.

The existing typical section for the I-10 main lanes include 10-ft outside shoulders, two 12-ft main lanes in each direction, and 4- to 6-ft inside shoulders. The I-10 main lanes are currently used as general-purpose lanes. The existing facility throughout the project area primarily consists of a depressed grassy median. Breaks in the grassy median occur at overpasses at bridges, in which the median consists of concrete barrier divides. Overhead sign bridges (OSB) and metal beam guard fences (MBGFs) are dispersed throughout the project limits. The existing facility includes two, two-way frontage road lanes in each direction, with inside and outside shoulders on both the northern and southern sides of the I-10 main lanes. The frontage road is not curbed. Throughout the project limits, existing entrance and exit ramps connect the I-10 frontage roads to the general-purpose main lanes.

The proposed project would add one High Occupancy Vehicle (HOV) and one general-purpose lane in each direction. Upon completion of the proposed project, each direction of I-10 would typically consist of a 10-ft inside shoulder, one 12-ft HOV lane, a 4-ft buffer, three 12-ft general purpose lanes, and a 10-ft outside shoulder. A 4-ft buffer would separate the HOV lanes from the general-purpose lanes with striping and/or flexible pylons spaced at 20-ft intervals used to define the buffers. All improvements are proposed within the existing 300-ft (minimum) ROW. Roadway appurtenances and signals will be relocated, removed, or added as needed.

No new improvements are proposed on the I-10 frontage roads. However, it should be noted that the project schematics depict ramp and frontage road work that will be conducted as part of ongoing separate construction contracts. These ongoing contracts are considered the existing condition for the proposed project and are called out on the schematics at “To be Constructed by Others”. As part of the project, there will be vegetation removal and grading within some existing drainage easements.

2.0 Noise Analysis

2.1 Background and Methodology

This analysis was accomplished in accordance with TxDOT's Federal Highway Administration (FHWA)-approved Guidelines for Analysis and Abatement of Roadway Traffic Noise (April 2011). Traffic volume data approved by TxDOT’s Transportation Planning and Programming division used in this analysis can be found in Appendix 2.

Sound from highway traffic is generated primarily from a vehicle’s tires, engine, and exhaust. It is commonly measured in decibels and is expressed as “dB”. Sound occurs over a wide range of
frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as “dB(A).” Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as “Leq.”

Dominant noise sources within the proposed project area include traffic on existing roads and various kinds of local activity.

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise;
- Determination of existing noise levels;
- Prediction of future noise levels;
- Identification of possible noise impacts; and
- Consideration and evaluation of measures to reduce noise impacts.

FHWA has established the Noise Abatement Criteria (NAC) listed in Table 1 for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur.

<table>
<thead>
<tr>
<th>Table 1: Noise Abatement Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Category</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td><strong>A</strong></td>
</tr>
<tr>
<td><strong>B</strong></td>
</tr>
<tr>
<td><strong>C</strong></td>
</tr>
<tr>
<td><strong>D</strong></td>
</tr>
<tr>
<td><strong>E</strong></td>
</tr>
<tr>
<td><strong>F</strong></td>
</tr>
<tr>
<td><strong>G</strong></td>
</tr>
</tbody>
</table>

A noise impact occurs when either the absolute or relative criterion is met:

- **Absolute criterion**: the predicted noise level at a receiver approaches, equals or exceeds the NAC. "Approach" is defined as 1 dB(A) below the FHWA NAC. For example: a noise
impact would occur at a Category B residence if the noise level is predicted to be 66 dB(A) or above.

- **Relative criterion:** the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal or exceed the NAC. “Substantially exceeds” is defined as more than 10 dB(A). For example: a noise impact would occur at a Category B residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

The FHWA traffic noise modeling software (version 2.5) was used to calculate existing and predicted (2044) traffic noise levels. The model primarily considers the number, type, and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

### 2.2 Consideration of Future Noise Impacts

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 2** and **Figure 2**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.
### Table 2: Traffic Noise Levels dB(A) Leq

<table>
<thead>
<tr>
<th>Receiver</th>
<th>NAC Category</th>
<th>NAC Level</th>
<th>Existing 2024</th>
<th>Predicted 2044</th>
<th>Change (+/-)</th>
<th>Noise Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>B (Residential)</td>
<td>67</td>
<td>54</td>
<td>57</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R2</td>
<td>B (Residential)</td>
<td>67</td>
<td>56</td>
<td>58</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R3</td>
<td>E (Hotel)</td>
<td>72</td>
<td>59</td>
<td>61</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R4</td>
<td>E (Restaurant)</td>
<td>72</td>
<td>59</td>
<td>61</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R5</td>
<td>D (Church)</td>
<td>52</td>
<td>35</td>
<td>37</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R6</td>
<td>E (Hotel)</td>
<td>72</td>
<td>62</td>
<td>65</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R7</td>
<td>B (Residential)</td>
<td>67</td>
<td>56</td>
<td>58</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R8</td>
<td>E (Hotel)</td>
<td>72</td>
<td>60</td>
<td>62</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R9</td>
<td>B (Residential)</td>
<td>67</td>
<td>53</td>
<td>55</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R10</td>
<td>B (Residential)</td>
<td>67</td>
<td>55</td>
<td>57</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R11</td>
<td>B (Residential)</td>
<td>67</td>
<td>55</td>
<td>57</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R12</td>
<td>B (Residential)</td>
<td>67</td>
<td>63</td>
<td>65</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R13</td>
<td>B (Residential)</td>
<td>67</td>
<td>65</td>
<td>67</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R14</td>
<td>B (Residential)</td>
<td>67</td>
<td>60</td>
<td>61</td>
<td>+1</td>
<td>Yes</td>
</tr>
<tr>
<td>R15</td>
<td>C (RV Park)</td>
<td>67</td>
<td>59</td>
<td>61</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R16</td>
<td>B (Residential)</td>
<td>67</td>
<td>67</td>
<td>68</td>
<td>+1</td>
<td>Yes</td>
</tr>
<tr>
<td>R17</td>
<td>B (Residential)</td>
<td>67</td>
<td>68</td>
<td>69</td>
<td>+1</td>
<td>Yes</td>
</tr>
<tr>
<td>R18</td>
<td>B (Residential)</td>
<td>67</td>
<td>64</td>
<td>65</td>
<td>+1</td>
<td>No</td>
</tr>
<tr>
<td>R19</td>
<td>B (Residential)</td>
<td>67</td>
<td>69</td>
<td>70</td>
<td>+1</td>
<td>Yes</td>
</tr>
<tr>
<td>R20</td>
<td>B (Residential)</td>
<td>67</td>
<td>68</td>
<td>70</td>
<td>+2</td>
<td>Yes</td>
</tr>
<tr>
<td>R21</td>
<td>B (Residential)</td>
<td>67</td>
<td>59</td>
<td>62</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R22</td>
<td>B (Residential)</td>
<td>67</td>
<td>64</td>
<td>67</td>
<td>+3</td>
<td>Yes</td>
</tr>
<tr>
<td>R23</td>
<td>B (Residential)</td>
<td>67</td>
<td>60</td>
<td>63</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R24</td>
<td>B (Residential)</td>
<td>67</td>
<td>63</td>
<td>67</td>
<td>+4</td>
<td>Yes</td>
</tr>
<tr>
<td>R25</td>
<td>B (Residential)</td>
<td>67</td>
<td>62</td>
<td>64</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R26</td>
<td>B (Residential)</td>
<td>67</td>
<td>65</td>
<td>68</td>
<td>+3</td>
<td>Yes</td>
</tr>
<tr>
<td>R27</td>
<td>D (Church)</td>
<td>52</td>
<td>42</td>
<td>44</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R28</td>
<td>B (Residential)</td>
<td>67</td>
<td>60</td>
<td>62</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R29</td>
<td>B (Residential)</td>
<td>67</td>
<td>61</td>
<td>63</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R30</td>
<td>B (Residential)</td>
<td>67</td>
<td>58</td>
<td>60</td>
<td>+2</td>
<td>No</td>
</tr>
<tr>
<td>R31</td>
<td>B (Residential)</td>
<td>67</td>
<td>60</td>
<td>63</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R32</td>
<td>B (Residential)</td>
<td>67</td>
<td>60</td>
<td>63</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R33</td>
<td>B (Residential)</td>
<td>67</td>
<td>60</td>
<td>63</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R34</td>
<td>B (Residential)</td>
<td>67</td>
<td>59</td>
<td>62</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R35</td>
<td>B (Residential)</td>
<td>67</td>
<td>57</td>
<td>60</td>
<td>+3</td>
<td>No</td>
</tr>
<tr>
<td>R36</td>
<td>B (Residential)</td>
<td>67</td>
<td>56</td>
<td>60</td>
<td>+4</td>
<td>No</td>
</tr>
<tr>
<td>R37</td>
<td>C (Playground)</td>
<td>67</td>
<td>61</td>
<td>65</td>
<td>+4</td>
<td>No</td>
</tr>
<tr>
<td>R38</td>
<td>B (Residential)</td>
<td>67</td>
<td>65</td>
<td>67</td>
<td>+2</td>
<td>Yes</td>
</tr>
<tr>
<td>R39</td>
<td>B (Residential)</td>
<td>67</td>
<td>64</td>
<td>67</td>
<td>+3</td>
<td>Yes</td>
</tr>
<tr>
<td>R40</td>
<td>B (Residential)</td>
<td>67</td>
<td>65</td>
<td>68</td>
<td>+3</td>
<td>Yes</td>
</tr>
<tr>
<td>R41</td>
<td>B (Residential)</td>
<td>67</td>
<td>59</td>
<td>63</td>
<td>+4</td>
<td>No</td>
</tr>
</tbody>
</table>
As indicated in Table 2, the proposed project would result in a traffic noise impact at 15 representative receiver locations, and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone, and the construction of noise walls.

Before any abatement measure can be proposed for incorporation into the project, it must be both feasible and reasonable. In order to be "feasible," the abatement measure must be able to reduce the noise level at greater than 50% of impacted first row receivers by at least 5 dB(A); and to be "reasonable," it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least 5 dB(A), and the abatement measure must be able to reduce the noise level for at least one impacted first row receiver by at least 7 dB(A).

**Traffic management** - Control devices could be used to reduce the speed of the traffic; however, the minor benefit of 1 dB(A) per five mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures, such as time or use restrictions for certain vehicles, are prohibited on state highways.

**Alteration of horizontal and/or vertical alignments** - Any alteration of the existing alignment would displace existing businesses and residences, require the acquisition of new right-of-way and would not be cost effective/reasonable.

**Buffer zone** - The acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

**Noise walls** - This is the most commonly used noise abatement measure. Noise walls were evaluated for each of the impacted receiver locations with the following results:

R13,16,17,19,20,22,24,45,46,47: These receivers represent separate, individual residences. Noise walls that would achieve the minimum feasible reduction of 5 dB(A)
while achieving a 7 dB(A) noise reduction design goal at each of these receivers would exceed the reasonable, cost-effectiveness criterion of $25,000.

**R26:** This is a second-row receiver that represents a group of 3 mobile homes located behind a row of commercial businesses. A noise wall within the right-of-way at this location would obstruct visibility and access to these businesses.

**R38-40:** These are second-row receivers that represent a total of 36 balconies facing the roadway at the Rustico At Fair Oaks Apartments, located behind medical offices and a school in the mixed-use development called Fair Oaks Crossing. A 20-foot wall was modeled within the right-of-way at this location. Due to gaps in the wall that would allow for access, the barrier would not be sufficient to achieve the minimum, feasible reduction of 5 dBA or the noise reduction design goal of 7 dBA.

**R48:** This is a second-row receiver that represents a group of 2 single-family homes located behind the entrance to the Scenic Oaks and Country Estates subdivisions. A noise wall within the right-of-way at this location would obstruct access to these subdivisions.

**R50:** This receiver represents the outdoor seating area at the Mi Casa Tamales restaurant. A noise wall that would achieve the minimum feasible reduction of 5 dB(A) while achieving a 7 dB(A) noise reduction design goal at this receiver would exceed the reasonable, cost-effectiveness criterion of $25,000.

None of the above noise abatement measures would be both feasible and reasonable; therefore, no abatement measures are proposed for this project.

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, that no new activities are planned or constructed along or within the following predicted (2044) noise impact contours. **Table 3** provides approximate predicted distances to noise contours for undeveloped areas adjacent to the project.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Impact Contour</th>
<th>Distance from Right-of-Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAC Category B &amp; C</td>
<td>66 dB(A)</td>
<td>255 feet</td>
</tr>
<tr>
<td>NAC Category E</td>
<td>71 dB(A)</td>
<td>100 feet</td>
</tr>
</tbody>
</table>

### 2.3 Construction Noise
Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. The receiver is not expected to be exposed to construction noise for a long duration;
therefore, any extended disruption of normal activities is not expected. Provisions will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

3.0 Conclusions
As indicated in Table 2, the proposed project would result in a traffic noise impact at 15 representative receiver locations. Noise abatement measures were examined at each of the impacted receivers and none were found to be both feasible and reasonable; therefore, no abatement measures are proposed for this project.

4.0 Local Officials Statement
A copy of this traffic noise analysis will be made available to local officials to ensure, to the maximum extent possible, future developments are planned, designed, and programmed in a manner that would avoid traffic noise impacts. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.
Appendix 1

Figures
Figure 1
Project Location (Road Base)
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Basemap Source: ESRI (2018)

Prepared for: TxDOT

CSJs: 0072-06-082 & 0072-07-075

Date: 10/22/2018

Project Location

Boerne
San Antonio

Bexar and Kendall Counties

Project Begin

Project End
Figure 2a
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Data Sources:
TxDOT (2018)
Aerial Source: Google (2018)

Scale: 1:6,000
Date: 5/24/2019
Prepared for: TxDOT

CSJs: 0072-06-082 & 0072-07-075

I-10 from SH 46 to Ralph Fair Rd (FM 3351)
Figure 2b
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Data Sources:
TxDOT (2018)
Aerial Source: Google (2018)

Scale: 1:6,000
Date: 5/24/2019
Prepared for: TxDOT
CSJs: 0072-06-082 & 0072-07-075

Sheet Limits  Non-impacted Receiver  Project Location  Impacted Receiver  Existing Barrier

1 meter = 500 feet
Grading within Existing Easement

Scenic Loop Rd
CR 102
CR 637
CR 680
CR 370
CR 635
CR 255
CR 589
CR 256
CR 254
CR 580
Torrie Trl
Amelia Breeze
Bethany Way
Sutter Mills
Katie W Ct
Deerwood Oaks
Sage Cyn
Shadow Knls
Winding Path
Sophia Cir
Parkway Dr
Michelle Ln
Jordan Pl
Enterprise Pkwy
Katie Ct

Figure 2c
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Sheet Limits
Non-impacted Receiver
Impact Receiver

Data Sources:
TxDOT (2018)
Aerial Source: Google (2018)

Date: 5/24/2019
Scale: 1:6,000
Prepared for: TxDOT
CSJs: 0072-06-082 & 0072-07-075

I-10 from SH 46 to Ralph Fair Rd (FM 3351)
Figure 2d
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Data Sources:
TxDOT (2018)
Aerial Source: Google (2018)

Scale: 1:6,000
Date: 5/24/2019
Prepared for: TxDOT
CSJs: 0072-06-082 & 0072-07-075
Figure 2e
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Data Sources:
TxDOT (2018)
Aerial Source: Google (2018)

Scale: 1:6,000
Date: 5/24/2019
Prepared for: TxDOT

Sheet Limits
Non-impacted Receiver
Impacted Receiver

1 in = 500 feet
0 0
500 Meters
500 Feet

Fair Oaks Pkwy
CR 112
CR 129
CR 123
CR 106
CR 114
CR 111
CR 125
CR 128
CR 122
CR 124
CR 110
CR 106
CR 110
CR 328
CR 80
Gate For es t
Leslie Pfeiffer Dr
Fawn Dr
Saxet Dr
Red Fish Dr
Deer Ridge Dr
Pompano Dr
Marlin Dr
Sailfish Dr
W Waterview Dr
Aqua Dietz Elkhor n
Windwood Dr
Tarpon Dr
Victoria Ln
E Windwood Dr
E Wat erview Dr

Figure 2e
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)
Figure 2f
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Data Sources:
TxDOT (2018)
Aerial Source: Google (2018)

1 in = 500 feet
Scale: 1:6,000
Date: 5/24/2019
Prepared for: TxDOT
CSJs: 0072-06-082 & 0072-07-075

Sheet Limits
Project Location
Non-impacted Receiver
Impacted Receiver
Figure 2g
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)
Figure 2h
Location of Noise Receivers
I-10 from SH 46 to Ralph Fair Rd (FM 3351)

Data Sources:
TxDOT (2018)
Aerial Source: Google (2018)

1 in = 500 feet
Scale: 1:6,000
Date: 5/24/2019
Prepared for: TxDOT
CSJs: 0072-06-082 & 0072-07-075

I-10 from SH 46 to Ralph Fair Rd (FM 3351)
Appendix 2
Traffic Analysis for Highway Design and Anticipated Average Daily Traffic
# TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

**San Antonio District**

## November 30, 2018

### Description of Location

<table>
<thead>
<tr>
<th>Average Daily Traffic</th>
<th>Dir Dist %</th>
<th>K Factor</th>
<th>Percent Trucks</th>
<th>Percent Tandem Axles in ATHWLD</th>
<th>Flexible Pavement</th>
<th>Rigid Pavement</th>
<th>SLAB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Year</strong></td>
<td><strong>2024</strong></td>
<td><strong>2044</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I-10</strong></td>
<td>From SH 46</td>
<td>To FM 3351</td>
<td>Kendall &amp; Bexar County</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>DRAFT</em> - No Build</td>
<td>105,300</td>
<td>159,000</td>
<td>50-50</td>
<td>8.6</td>
<td>8.0</td>
<td>3.6</td>
<td>0</td>
</tr>
</tbody>
</table>

### Data for Use in Air & Noise Analysis

<table>
<thead>
<tr>
<th>Vehicle Class</th>
<th>% of ADT</th>
<th>% of DHV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Duty</td>
<td>92.0</td>
<td>96.4</td>
</tr>
<tr>
<td>Medium Duty</td>
<td>1.4</td>
<td>0.1</td>
</tr>
<tr>
<td>Heavy Duty</td>
<td>6.6</td>
<td>3.0</td>
</tr>
</tbody>
</table>

### Total Number of Equivalent 18k Vehicle Class

<table>
<thead>
<tr>
<th>Description of Location</th>
<th>Average Daily Traffic</th>
<th>Dir Dist %</th>
<th>K Factor</th>
<th>Percent Trucks</th>
<th>Percent Tandem Axles in ATHWLD</th>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>DRAFT</em> - No Build</td>
<td>105,300</td>
<td>175,800</td>
<td>50-50</td>
<td>8.6</td>
<td>8.0</td>
<td>3.6</td>
<td>0</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>

**20 Year Period (2024 to 2044)**

- **ATHWLD Percent**
- **Tandem Axles in ATHWLD**
- **Flexible Pavement**
- **Rigid Pavement**
- **SLAB**
<table>
<thead>
<tr>
<th>Description of Location</th>
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<th>Dir Dist %</th>
<th>K Factor</th>
<th>Percent Trucks</th>
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<th>Flexible Pavement</th>
<th>Rigid Pavement</th>
<th>SLAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-10 <em>DRAFT</em> - Build</td>
<td>97,500 147,400</td>
<td>50-50</td>
<td>8.6</td>
<td>8.0</td>
<td>3.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>From SH 46 To FM 3351</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>3</td>
<td>0</td>
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Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2024 to 2044)
IH 10 TRAFFIC DIAGRAM
FROM SH 46 TO FM 3351
2024, 2044, AND 2054
BUILD ADT

NOT TO SCALE

LEGEND
1,000 - 2024 ADT
1,000 - 2044 ADT
1,000 - 2054 ADT

NOTICE: PRELIMINARY TRAFFIC,
ANALYSIS AND APPROVAL

Texas Department of Transportation

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AWAITING TP&P APPROVAL
NOTE: PRELIMINARY TRAFFIC,
ANALYSIS AND APPROVAL

TEXAS DEPARTMENT OF TRANSPORTATION
2018
Firm Registration No. F-754
HDR
972.960.4400
Dallas, Texas 75248-1229
17111 Preston Road, Suite 300
IH 10 TRAFFIC DIAGRAM
FROM SH 46 TO FM 3351
2024, 2044, AND 2054
BUILD ADT

Texas Department of Transportation
© 2018

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FROM SH 46 TO FM 3351
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Texas Department of Transportation
HDR
Firm Registration No. F-754
HDR 972.960.4400
Dallas, Texas 75248-1229
17111 Preston Road, Suite 300

SAT 06

FEDERAL PROJECT NO. BEXAR/KENDALL 082
IH 10 TRAFFIC DIAGRAM
FROM SH 46 TO FM 3351
2024, 2044, AND 2054
NO BUILD ADT

NOT TO SCALE

Texas Department of Transportation

IH 10

MATCHLINE A

MATCHLINE B

I-10
IH 10 TRAFFIC DIAGRAM
FROM SH 46 TO FM 3351
2024, 2044, AND 2054
NO BUILD ADT

NOT TO SCALE

LEGEND
1,000 - 2024 ADT
1,000 - 2044 ADT
1,000 - 2054 ADT

AWAITING TP&P APPROVAL
NOTE: PRELIMINARY TRAFFIC

Texas Department of Transportation

© 2018

IH 10 SHEET 05 OF 09
JOB SITE:
COUNTY:
STATE:
FED. RD.:
DIV. NO.:
DISTRICT:
SHEET #: 0072
HIGHWAY NO.:
COUNTY:
JOB #: 06
CONTROL SECTION №: 082
SAT: 10/27/2018
TIME: 10:10:49
SCALE: 1:400.004

PEN TABLE:
$ PW VAULT P HD E S C $
IH 10 TRAFFIC DIAGRAM
FROM SH 46 TO FM 3351
2024, 2044, AND 2054
NO BUILD ADT

TEXT:

- Texas Department of Transportation
- HDR
- SHEET 06 OF 09
- IH 10 TRAFFIC DIAGRAM
- FROM SH 46 TO FM 3351
- 2024, 2044, AND 2054
- NO BUILD ADT
- HDR
- SHEET 06 OF 09
- IH 10 TRAFFIC DIAGRAM
- FROM SH 46 TO FM 3351
- 2024, 2044, AND 2054
- NO BUILD ADT

DIAGRAM:

- Matchline E
- Matchline F
- IH 10
- Legend:
  - 1,000 - 2024 ADT
  - 1,000 - 2044 ADT
  - 1,000 - 2054 ADT

- Table:

<table>
<thead>
<tr>
<th>Year</th>
<th>2024 ADT</th>
<th>2044 ADT</th>
<th>2054 ADT</th>
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<tbody>
<tr>
<td></td>
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</tbody>
</table>

- Notes:
  - Preliminary traffic
  - Not to scale
IH 10 TRAFFIC DIAGRAM
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NOT TO SCALE

1,000 - 2024 ADT
1,000 - 2044 ADT
1,000 - 2054 ADT

N1

LEGEND

MATCHLINE F

MATCHLINE G

N7
IH 10 TRAFFIC DIAGRAM
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AWAITING TP&P APPROVAL
NOTE: PRELIMINARY TRAFFIC

FEDERAL PROJECT NO.
BEXAR/KENDALL
082

TIMESTAMP  9/27/2018  10:10:49 AM

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USERS: 1
SCALE: 1:400.004
PLOT DRIVER: TXDOT_PDF_BW.png
TABLE: PW VAULT PATTERN TABLE

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3,300 5,000 5,500
4,800 7,000 7,800
3,000 4,800 5,700
14,300 21,500 23,900

FHWA SPECIFICATIONS
3,700 5,500 6,200
4,300 7,000 7,900
4,700 7,000 7,900
14,300 21,500 23,900

TIPPLE BORROWING
2,400 3,600 4,000
2,500 3,700 4,300
3,700 5,500 6,200
18,500 27,800 30,900

HIGHWAY NO.
IH 10

FIRM REGISTRATION NO. F-754
HDR 972.960.4400
Dallas, Texas  75248-1229
17111 Preston Road, Suite 300

FED.RD.
DIV.NO.
STATE
JOB
COUNTY
DISTRICT
CONTROL
SECTION
SHEET NO.
HIGHWAY
NO. SHEET...